WHAT WE CLAIM IS:

1. A loudspeaker horn for use with aligned and relatively widely spaced acoustic power sources and having a propagation axis, said loudspeaker horn comprising

a throat end having a transversely elongated throat for receiving acoustic power from aligned acoustic power sources, said elongated throat having a top, a bottom, and elongated sides defining a long dimension,

a flared section extending from said throat end, said flared section having end walls extending from the top and bottom of said throat and flared side walls extending from the elongated sides of said throat, said flared section further having a mouth end through which acoustic power received at the throat end of the loudspeaker horn is propagated into space in a characteristic distribution pattern, and

grating lobe mitigation fins disposed in said flared section between the end walls thereof, said grating lobe mitigation fins being disposed in planes substantially perpendicular to the long dimension of said throat and substantially parallel to the horn's propagation axis, and extending for a substantial distance from the throat of the horn toward the mouth end of said flared section for mitigating grating lobes produced by aligned acoustic power sources at the throat end of the horn.

2. The loudspeaker horn of claim 1 wherein said grating lobe mitigation fins extend from the throat end of the horn to near the mouth end of the flared section of the horn.

3. The loudspeaker horn of claim 1 wherein said grating lobe mitigation fins extend from the throat end of the horn substantially the entire length of the flared section of the horn.

4. The loudspeaker horn of claim 1 wherein the throat end of the horn further includes coupling chambers associated with the aligned acoustic power sources for coupling acoustic power produced by the acoustic power sources to the horn's elongated throat.

5. The loudspeaker horn of claim 4 wherein said coupling chambers transition from a round geometry at the acoustic power sources to a rectangular geometry at the horn's elongated throat.

6. The loudspeaker horn of claim 5 wherein the size of each of said coupling chambers is in the order of one wavelength or smaller at the highest operating frequency of the loudspeaker.

7. The loudspeaker horn of claim 4 wherein said grating lobe mitigation fins each have a base end which extends into the throat end of the horn to isolate the coupling chambers one from the other and to divide the elongated throat into aligned throat openings associated with each acoustic power source of said aligned acoustic power sources.

8. The loudspeaker horn of claim 1 wherein said throat end of the horn is formed to received acoustic power from N aligned acoustic power sources where N is an integer, and wherein N-1 grating lobe mitigation fins are provided between the end walls of said flared section.

9. The loudspeaker horn of claim 1 wherein said throat end of the horn is formed to

receive acoustic power from three aligned acoustic power sources, and wherein two grating lobe mitigation fins are provided between the end walls of said flared section.

10. The loudspeaker horn of claim 1 wherein the throat end of said horn includes a mounting surface for mounting multiple acoustic power sources to the throat end of the horn in aligned relation with the horn's elongated throat open.

11. A horn for a loudspeaker for use with aligned and relatively widely spaced acoustic power sources and having a propagation axis, said loudspeaker horn comprising

a throat end having an elongated rectangular throat and aligned coupling chambers for coupling acoustic power produced by aligned acoustic power sources having a circular geometry to the rectangular geometry of the horn's elongated throat, said elongated throat having a top, a bottom, and elongated sides defining a long dimension,

a flared section extending from said throat end, said flared section having end walls extending from the top and bottom of said elongated throat, and flared side walls extending from the elongated sides of said throat,

a mouth end at the end of the flared section opposite said throat end through which acoustic power received at said throat end is propagated from the loudspeaker horn into space, and

grating lobe mitigation fins disposed in said flared section between the end walls thereof, said grating lobe mitigation fins being disposed in planes substantially perpendicular to the long dimension of said throat and substantially parallel to the horn's propagation axis, and extending for a substantial distance from the throat of the horn toward the mouth end of said flared section

for mitigating grating lobes produced by aligned acoustic power sources at the throat end of the horn.

12. The loudspeaker horn of claim 11 wherein the throat end of said horn includes a mounting surface having aligned circular openings therein associated with said coupling chambers for mounting multiple circular acoustic power sources to the throat end of the horn in aligned relation with the horn's elongated rectangular throat open.

13. The loudspeaker horn of claim 12 wherein said mounting surface is provided by an elongated rectangular flange.

14. The loudspeaker horn of claim 11 wherein said grating lobe mitigation fins extend from the throat end of the horn to near the mouth end of the horn.

15. The loudspeaker horn of claim 11 wherein said grating lobe mitigation fins extend from the throat end of the horn substantially the entire length of the flared section of the horn.

16. The loudspeaker horn of claim 11 wherein said grating lobe mitigation fins are tapered in the direction of the mouth end of the horn.

17. A horn for a loudspeaker for use with aligned and relatively widely spaced acoustic power sources, said loudspeaker horn comprising

a throat end for receiving acoustic power from aligned acoustic power sources,

a flared section having flared side walls that converge to an elongated throat at the throat end of the horn, said elongated throat being divided into aligned throat openings associated with the acoustic power sources of aligned acoustic power sources, and

grating lobe mitigation fins in said flared section extending from between the aligned throat openings of said throat end a substantial distance toward the mouth end of the flared section of the horn a sufficient distance for mitigating grating lobes produced by aligned acoustic power sources at the throat end of the horn.

18. The loudspeaker horn or claim 17 wherein the loudspeaker horn has a propagation axis and said grating lobe mitigation fins extending from between the aligned throat openings of said throat substantially parallel to said propagation axis.

19. The loudspeaker horn or claim 17 wherein the throat end of the loudspeaker horn includes coupling chambers aligned behind said elongated throat for coupling the each acoustic power source of said aligned acoustic power sources with each throat opening of said aligned throat opening.

20. The loudspeaker horn or claim 19 wherein said coupling chambers transition from a round geometry at the acoustic power sources to a rectangular geometry at the throat openings at horn's elongated throat.

21. The loudspeaker horn of claim 19 wherein the size of each of said coupling chambers is in the order of one wavelength or smaller at the highest operating frequency of the loudspeaker.

22. The loudspeaker horn of claim 19 wherein said coupling chambers transition from a round geometry at the acoustic power sources to a rectangular geometry at the throat openings of horn's elongated throat.

23. The loudspeaker horn of claim 22 wherein said grating lobe mitigation fins extend from the throat end of the horn to near the mouth end of the flared section of the horn.

24. The loudspeaker horn of claim 22 wherein said grating lobe mitigation fins extend from the throat end of the horn substantially the entire length of the flared section of the horn.

25. A horn loudspeaker comprising

a. a horn comprised of

i.) a throat end with a transversely elongated throat having a top, a bottom, and elongated sides defining a long dimension, and

ii.) a flared section extending from said throat end, said flared section having end walls extending from the top and bottom of said throat, and flared side walls extending from the elongated sides of said throat, said flared section further having a mouth end through which acoustic power received at the throat end of said horn is propagated into space in a characteristic distribution pattern,

b. aligned acoustic power sources mounted to the throat end of said horn and spaced apart by at least one wavelength at the highest operating frequency of the loudspeaker, and

c. grating lobe mitigation fins disposed in the flared section of said horn between the end walls thereof, said grating lobe mitigation fins being disposed in planes substantially perpendicular to the long dimension of the throat of said horn and substantially parallel to the horn's propagation

axis, and extending for a substantial distance from the throat of the horn toward the mouth end of said flared section for mitigating grating lobes produced by aligned acoustic power sources at the throat end of the horn.

26. The loudspeaker horn of claim 25 wherein said grating lobe mitigation fins extend from the throat end of the horn to near the mouth end of the flared section of the horn.

27. The loudspeaker horn of claim 25 wherein said grating lobe mitigation fins extend from the throat end of the horn substantially the entire length of the flared section of the horn.

28. A method of suppressing grating lobes produced by aligned and relatively widely spaced acoustic power sources comprising

selecting acoustic power sources for an aligned array of acoustic power sources,

selecting a horn for said aligned array of acoustic power sources, wherein said horn has a transversely elongated throat for receiving acoustic power from said aligned array of acoustic power sources, and wherein the horn has a flared section which extends from said throat end and which terminates at a mouth end through which acoustic power received from the aligned array of acoustic power sources at the throat end of the horn is propagated into space in a characteristic distribution pattern,

providing grating lobe mitigation fins in the flared section of said horn which are substantially parallel to the propagation axis of the horn, the length of said grating lobe mitigation fins being selected to achieve a desired level of suppression of the grating lobes produced by said aligned array of acoustic power sources.

29. The method of claim 28 wherein the length of said grating lobe mitigation fins is determined empirically.

30. The method of claim 28 wherein said aligned acoustic power sources are matched drivers, and wherein the length of said grating lobe fins is determined empirically using a single driver.

31. The method of claim 28 wherein the length of said grating lobe fins is determined empirically by

choosing a desired acoustic power sources for the aligned array of acoustic power sources,

determining the length of the grating lobe fins needed to achieve directional characteristics for a single one of the aligned acoustic power sources that suppresses off-axis acoustic power for the acoustic power source in the region of the predicted grating lobes for the aligned power sources to the desired suppression levels for the grating lobes, and

providing the flared section of the horn with grating lobe fins of the determined length using the single acoustic power source, or longer.

32. The method of claim 31 wherein said aligned acoustic power sources are matched drivers.